

### **REMARKS**

Pursuant to this Reply, claims 1-4 and 6-10 are pending in this application. The drawings are objected to for failing to show the operational amplifier of claim 7. Claims 1-3, 5-6, and 8-10 stand rejected under 35 U.S.C. 102(b) as being anticipated by Hu et al. (U.S. Patent No. 5,107,184). In the foregoing amendment, Claim 5 is incorporated into Claim 1 to include the detailed components of the ballast circuit of the present invention, Claim 7 is amended to correct a typing error (voltage converter instead of voltage regulator), Claims 8 and 10 are amended to correct a typing error, and Fig. 4 is modified to show the voltage converter having an operational amplifier as described above. Claim 5 is canceled without prejudice. These modifications can find support from either the original version of the specification and the prior art or are known to one with the ordinary skill in the field, and these modifications are employed to clarify the contents of the application. Thus, the above-mentioned modifications do not contain any new matter

### **Inventorship**

The esteemed examiner presumed that the subject matter of the various claims of the present invention was commonly owned. And, yes, the joint inventors of the present invention commonly do own the subject matter of the various claims of the present invention.

**Drawings Objection**

The esteemed examiner considered that the 'operational amplifier' recited in line 2 of Claim 7 must be shown. The Fig. 4 is modified according to the esteemed examiner's opinions etc. as described above.

**Rejection Under 35 U.S.C. §102**

The esteemed examiner commented that Claims 1-3, 5-6, and 8-10 are rejected under 35 U.S.C. 102 (b) as being anticipated by Hu et al. (U.S. Patent No. 5,107,184).

Regarding Claim 1, the esteemed examiner pointed out that a frequency-modulated dimming control system including a voltage regulator having a variable output voltage and a ballast circuit for driving the discharge lamp has been disclosed in Figs. 1-3 and 5 of the '184 Patent.

After reviewing the '184 Patent, the applicants respectfully submit that the present invention is not anticipated by the '184 Patent due to the following differences and advantages:

1. The frequency-modulated dimming control system of the claimed invention as disclosed in the amended Claim 1 has a simpler configuration than the disclosed ballast of the '184 Patent.

The proposed dimming control system of the claimed invention has a much simpler configuration than the '184 Patent. For example, the '184 patent includes a regulator and power factor control unit 24 having a much more complex configuration than the claimed invention. More specifically, the configuration disclosed in the '184 Patent not only includes an integrated circuit 110 and an AC boost converter, but also other components such as switch 112, resistor 117... etc., as well as the decoder unit 20 as shown in Figs. 1 and 5 of the '184 Patent. Further, the '184 Patent does not include a voltage converter having an operational amplifier as shown in Fig. 4 of the claimed invention. Since the AC boost converter is not a voltage converter as disclosed in the claimed invention and the decoder unit 20 is not employed in the claimed invention, the configuration of the claimed invention is much simpler than and clearly distinct from the '184 Patent.

2. The voltage converter of the frequency-modulated dimming control system of the claimed invention as claimed in the amended Claim 1 and the corresponding components of the disclosed ballast of the '184 Patent have different functions.

Regarding claim 1, the voltage converter of the proposed ballast circuit of the claimed invention is employed for detecting the variation of the bus voltage and amplifying the variation to produce a dimming signal. But in the '184 Patent, as an initial matter, the (remote) controller 14 removes one pulse from the incoming alternating waveform in a predetermined time period N, and the time between the missing pulses corresponds to a desired lamp dimming (power) level as described in Column 3, lines 65-68 and in Column 4, lines 1-3 of the '184 Patent, respectively. Further, the regulator and power factor control unit 24 of the '184 Patent must be operated with the decoder unit 20, coupled to the output of the rectifier 18 and providing a reference control signal on lead 22 to the regulator and power factor control unit 24, and the reference output signal from the decoder 20 determines the magnitude of the DC applied to inverter 26 and thus the AC voltage (current) applied to lamp 30 as described in Column 4, lines 9-12 and 30-33 of the '184 Patent. Further, the AC boost converter 114 is employed to boost the AC voltage as described in Column 6, lines 7-8 of the '184 Patent instead of the proposed voltage converter for detecting the variation of the bus voltage and amplifying the variation to produce a dimming signal as in the claimed invention.

According to the above-mentioned descriptions, the voltage converter of the claimed invention is employed to detect the variation of the bus voltage, amplify the variation of the bus, and produce a dimming signal. But in the '184 Patent, the lamp dimming level is determined by the controller 14 and detected by the decoder unit 20, and the magnitude of the DC current output from the regulator and power factor control unit 24 and applied to the inverter 26 is determined by the reference control signal from the decoder unit 20. Thus, the voltage converter of the claimed invention and the corresponding components of the ballast of the '184 Patent have different functions.

3. The total manufacturing costs of the claimed invention would be lower and the reliability would be higher than those of the '184 Patent due to the simpler configuration and fewer components of the claimed invention.

For the above-mentioned reasons, it is respectfully submitted that Claim 1 is not anticipated by the '184 Patent. Claims 2-4, and 6-10 are dependent claims of Claim 1 and therefore it is also respectfully submitted that claims 2-4 and 6-10 are not anticipated by the '184 Patent. Furthermore, it is also respectfully submitted that the claimed invention is not rendered obvious in view of any of the references cited by the Examiner.

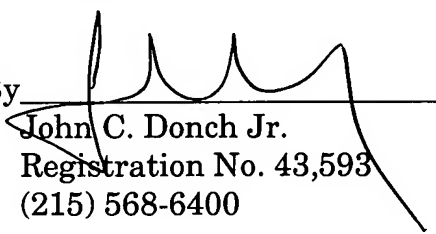
**Applicant:** Lee et al.  
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For the above reasons, Applicants respectfully submit that the presently claimed invention is patentable over the prior art. Reconsideration and allowance of the claims is respectfully requested.

Respectfully submitted,

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Enclosures (2)

**IN THE DRAWINGS**

In Fig. 4, the voltage converter 35 is modified to show that the voltage converter 35 includes an operational amplifier and other elements as disclosed in the amended claim 7 according to the esteemed Examiner's opinion. Further, extra connecting circuits among voltage converter 35, the inverter 36, the ballast control integrated circuit, and the discharge lamp 12 are modified and three capacitors (one for the resonant LC circuit and two for the half-bridge circuit, which all are elements of the ballast circuit known in the prior art) are added in Fig. 4 so as to show the configuration of the proposed dimming control system in more detail such that the unique features of the present invention can be fully understood.

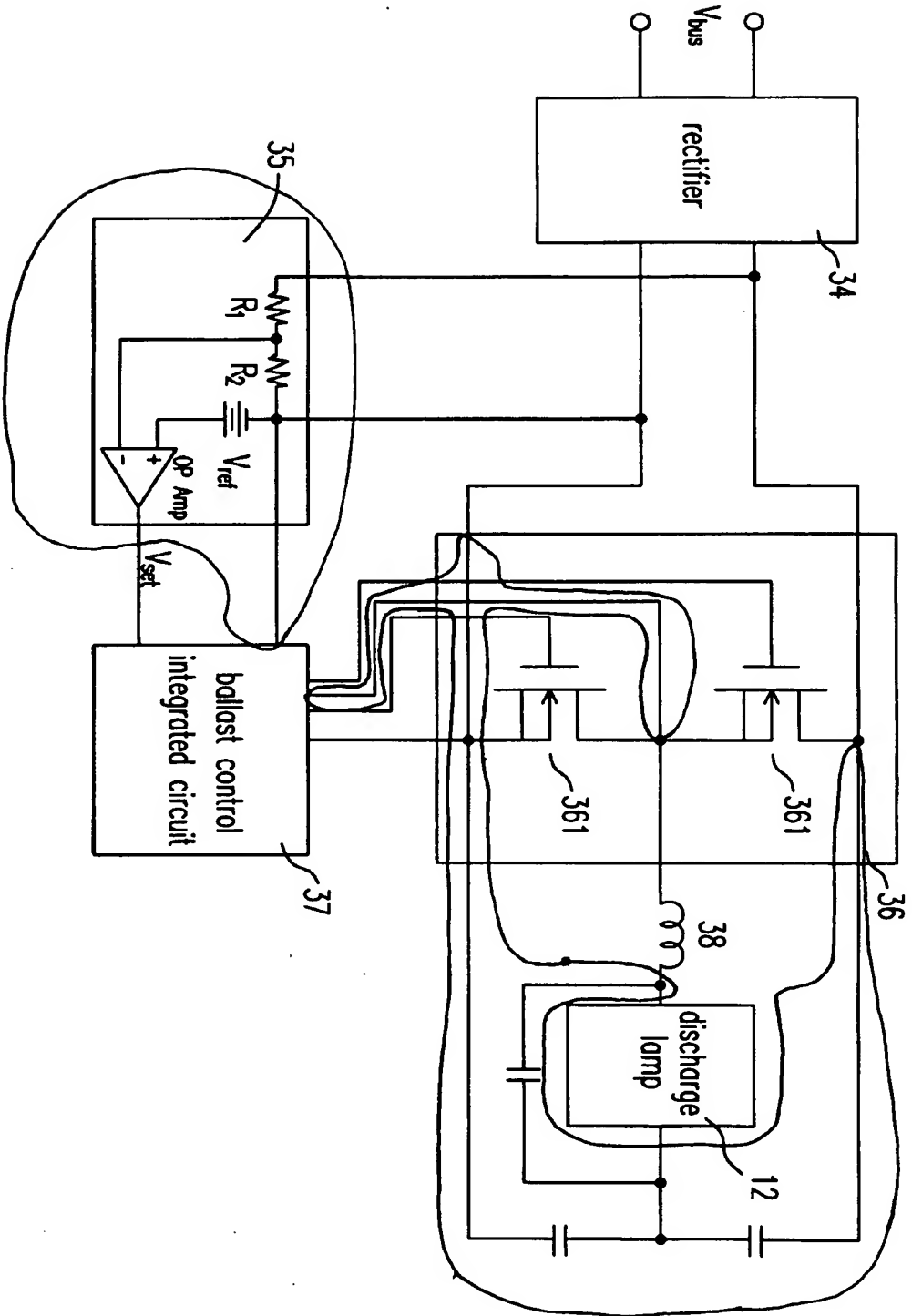


Fig. 4